ATTACHMENT 1

LABORATORY ANALYTICAL DATA COLLECTED AS PART OF THE ADDITIONAL INVESTIGATION

Analytical Results

Well	Screen	Sample Date	pH	Temperature	DO[a, b]	ORP[b]	Conductivity	DOC[c]	TOC	Iron	Ferrous Iron	Ferric Iron	Nitrite (as N)	Nitrate (as N)	Sulfide	Sulfate	Calcium	Sodium	Potassium	Magnesium	Chloride	TDS	Perchlorate[d]	Total Alkalinity	Ammonia (as NH_3)	Total Kjeldahl Nitrogen
Units	No.	mm/dd/yy	S.U.	°C	mg/L	mV	mS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L
MW-1	NA	06/05/05	7.6	14.1	0.8	222	0.60	14.9	0.830J (1)	0.31	ND (5)	0.30	ND (0.1)	1.3	ND (1)	54.8	68.3	30.0	3.9	21.4	26.4	360	ND (2)	200	ND (0.1)	0.1
MW-16	NA	02/09/06																								
MW-16	NA	11/22/06																								
MW-17	1	08/15/05	7.1	24.4	11.2	204	34.1	4.32	2.39	ND (0.2)	ND (5)	ND(0.2)	ND (0.1)	0.63	ND (1)	19.4	35.5	14.4	ND (2)	11.6	6.5	190	ND (4)[h]	126	ND (0.1)	0.277
	1 Dup	09/12/05																					ND (4)			
	2	08/15/05	6.6	23.8	12.1	210	87.7	3.39	2.64	0.29	ND (5)	0.29	ND (0.1)	7.8	ND (1)	98.7	106	24.5	3.8	36.6	68.2	695	9.7	212	ND (0.1)	0.304
	3	08/15/05	6.2	22.2	10.6	172	73.9	3.49	2.29	1.6	8.02	1.6	ND (0.1)	6.5	ND (1)	70.0	73.6	25.6	ND (2)	30.0	51.0	535	76.4	183	ND (0.1)	0.315
	4	08/15/05	6.2	19.9	11.2	178	34.3	2.79	2.31	ND (0.2)	ND (5)	ND(0.2)	ND (0.1)	0.21	ND (1)	19.0	18.1	46.9	2.4	4.8	10.1	235	ND (4)	126	ND (0.1)	0.549
	5	08/15/05	5.9	18.0	11.6	233	36.8	1.87	1.85	63	8.02	55	ND (0.1)	ND (0.1)	ND (1)	95.3	65.7	59.8	5.1	23.5	48.1	185	ND (4)[h]	123	ND (0.1)	0.181
MW-18	1	07/21/05	6.9	30.5	12.7	195	40.0	7.82	1.91	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.6	ND (1)	33.1	41.9	15.8	2.6	14.0	9.5	236	ND (4)[i]	127	ND (0.1)	ND (0.1)
	2	07/21/05	6.6	31.4	12.0	162	53.5	7.02	2.48	0.27	ND (5)	0.27	ND (0.1)	1.1	ND (1)	39.3	56.8	20.3	2.4	18.8	14.3	690	ND (4)[i]	183	ND (0.1)	0.244
	2 Dup	07/21/05						3.27	1.92	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.3	ND (1)	39.2	56.5	19.8	2.5	18.7	14.2	665		183	ND (0.1)	ND (0.1)
	3	07/21/05	6.0	30.0	11.0	194	60.5	6.72	1.63	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.3	ND (1)	40.7	66.2	23.8	2.9	19.7	16.1	790	5.7	211	ND (0.1)	ND (0.1)
	4	07/21/05	5.9	27.3	10.9	210	44.4	7.29	1.36	0.22	ND (5)	0.22	ND (0.1)	1.1	ND (1)	24.2	39.0	29.3	2.1	13.4	10.7	560	10.2	163	ND (0.1)	ND (0.1)
	5	07/21/05	6.0	23.4	10.1	241	34.0	2.53	1.15	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	ND	ND (1)	4.9	9.3	53.1	ND (2)	4.4	10.4	400	ND (4)	127	ND (0.1)	ND (0.1)
MW-19	1	07/20/05	7.5	29.7	8.5	166	43.1	8.67	2.98	2.5	ND (5)	2.5	ND (0.1)	1.4	ND (1)	26.3	42.5	19.8	3.4	16.8	20.1	600	ND (4)	145	0.202	0.473
	2	07/20/05	7.0	29.3	8.6	276	0.14	8.07	1.78	0.47	ND (5)	0.47	ND (0.1)	12.0[e]	ND (1)	135	115	34.4	ND (2)	43.1	92.0	736	6.7	201	0.144	0.389
	3	07/20/05	6.6	27.3	9.1	145	0.10	8.60	1.30	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	8.5[e]	ND (1)	42.2	64.8	28.9	ND (2)	25.4	39.9	426	3.2J (4)	175	ND (0.1)	0.377
	4	07/20/05	6.0	26.6	9.3	164	0.11	1.79	1.34	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	7.4[e]	ND (1)	57.8	69.7	33.3	ND (2)	31.9	54.4	494	3.0J (4)	191	0.277	0.533
	4 Dup	07/20/05						1.84	1.62	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	7.3[e]	ND (1)	58.1	71.5	33.9	2.2	32.7	54.8	450		186	ND (0.1)	0.611
	5	07/20/05	5.4	23.5	10.3	227	0.12	5.11	1.48	0.76	ND (5)	0.76	ND (0.1)	2.9[e]	ND (1)	75.3	67.8	35.9	2.5	41.5	68.4	504	2.7J (4)	191	ND (0.1)	0.788
MW-20	1	08/01/05	6.8	28.8	11.1	126	66.6	3.62	1.94	ND (0.2)[g]	ND (5)	ND (0.2)[g]	ND (0.1)	6.1	ND (1)	78.7	82.3[g]	20[g]	2.7[g]	26.3[g]	31.0	440	2.2J (4)	274	ND (0.1)	0.588
	2	08/01/05	7.0	26.6	10.7	92	41.6	2.62	1.95	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	2.2	ND (1)	28.7	51.2	13.8	2.5	16.9	13.4	275	ND (4)	144	0.119	0.357
	3	08/01/05	6.0	25.8	10.9	113	60.2	2.47	2.27	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	2.9	ND (1)	25.6	50.6	58.1	ND (2)	15.6	32.5	340	ND (4)	195	0.153	0.525
	4	08/01/05	6.5	23.1	10.3	-35	34.7	2.10	1.58	0.50	ND (5)	0.50	ND (0.1)	ND (0.1)	3.25	14.6	12.8	59.1	ND (2)	3.5	10.1	205	ND (4)	128	ND (0.1)	0.420
	5	08/01/05	6.1	20.2	11.1	-39	36.6	2.62	1.78	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	ND (0.1)	ND (1)	5.2	5.3	64	ND (2)	1.3	9.2	180	ND (4)	125	ND (0.1)	0.388
MW-21	1	07/26/05	7.4	32.2	9.9	156	0.14	4.18	2.58	ND (0.2)	ND (5)	ND (0.2)	ND(0.1)[g]	14.2[g]	ND(<1)[g]	152	126	34.2	2.7	40.9	103	760[g]	3.6J (4)	147	0.159	0.430
	2	07/26/05	7.4	25.9	11.6	161	0.18	8.44	2.70	ND (0.2)	ND (5)	ND (0.2)	ND(0.1)[g]	10.7[g]	ND(<1)[g]	178	152	70.5	2.8	50.3	133	925[g]	3.2J (4)	275	ND (0.1)	0.577
	3	07/26/05	7.5	25.9	9.8	171	0.16	3.29	2.37	ND (0.2)	ND (5)	ND (0.2)	ND(0.1)[g]	9.5[g]	ND(<1)[g]	140	150	44.4	3.4	47.0	108	900[g]	3.0J (4)	275	ND (0.1)	0.567
	3 Dup	07/26/05						3.04	2.39	0.25	ND (5)	0.25	ND(0.1)[g]	9.7[g]	ND(<1)[g]	144	156	46.3	3.0	49.3	112	825[g]	3.2J (4)	277	ND (0.1)	0.745
	4	07/26/05	6.2	25.6	10.9	59	0.12	2.48	2.07	ND (0.2)	ND (5)	ND (0.2)	ND(0.1)[g]	6.5[g]	ND(<1)[g]	96.5	96.8	30.5	2.4	29.9	64.3	545[g]	2.0J (4)	178	ND (0.1)	0.514
	5	07/26/05	5.1	22.8	12.1	200	0.13	2.38	1.97	ND (0.2)	ND (5)	ND (0.2)	ND(0.1)[g]	7.1E[g]	ND(<1)[g]	117	99.6	35.3	2.3	32.9	66.5	590[g]	3.3J (4)	181	ND (0.1)	0.420
MW-24	1	07/25/05	7.0	25.3	9.5	170	49.3	3.35	1.65	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.5	ND (1)	40.0	55.6	19.4	ND (2)	18.2	28.2	300	683	154	ND (0.1)	0.595
	1 Dup	07/25/05						1.74	1.59	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.5	ND (1)	40.5	55.1	19.4	ND (2)	18.2	28.4	310	670	159	ND (0.1)	0.766
	2	07/25/05	7.0	25.0	8.8	145	45.0	2.08	1.60	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.8	ND (1)	18.9	32.9	43.6	3.1	13.6	36.1	270	79.1	144	0.111	0.308
	3	07/25/05	5.9	26.2	9.2	123	37.7	5.38	1.50	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	0.42	ND (1)	14.9	18.9	44.8	ND (2)	13.3	18.3	235	ND (4)	142	0.117	0.393
	4	07/25/05	5.5	24.3	10.0	82	34.0	1.83	1.67	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	0.26	ND (1)	7.8	9.8	43.3	2.5	9.5	13.5	175	ND (4)[j]	127	0.254	0.681
	5	07/25/05	7.3	26.4	10.1	203	39.9	4.22	1.52	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.3	ND (1)	19.0	34.3	39.9	2.2	9.3	9.5	235	ND (4)[j]	164	ND (0.1)	0.340
	5 Dup	09/09/05																					ND (4)			
MW-25	1	07/19/05	6.6	27.3	9.7	210	85.8	12.1	1.69	0.34	ND (5)	0.34	ND (0.1)	12.8E[f]	ND (1)	127	98.7	32	3.0	32.9	70.0	610	11.7	152	0.106	0.511
	2	07/19/05	6.5	26.6	9.0	179	56.8	3.16	1.49	0.44	ND (5)	0.44	ND (0.1)	6.3[f]	ND (1)	82.4	14.9	81.2	2.5	19.8	34.0	324	17.4	135	ND (0.1)	0.333
	3	07/19/05	6.3	25.0	6.3	187	63.9	2.92	1.35	0.32	ND (5)	0.32	ND (0.1)	8.6[f]	ND (1)	62.3	68.4	39.5	2.1	25.1	33.4	414	14.3	175	ND (0.1)	0.522
	4	07/19/05	6.2	23.5	7.8	154	67.0	6.45	1.29	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	4.5[f]	ND (1)	63.6	64.5	58.4	ND (2)	19.5	32.6	420	10.0	211	ND (0.1)	0.444
	5	07/19/05	5.8	22.9	8.8	237	46.8	2.82	1.22	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	ND (0.1)[f]	ND (1)	54.1	21.9	68.4	ND (2)	6.1	13.4	264	ND (4)	145	ND (0.1)	ND (0.1)
OU-1		11/22/06																								
LAWC No. 3	NA	06/03/05	7.5	16.9	10.5	175.3	0.50	12.8	ND (1)	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	2.7	ND (1)	45.7	61.2	19	ND (2)	20.6	23.1	324	26	169	ND (0.1)	0.526
LFWC No. 2	NA	06/03/05	6.4	19.7	10.6	211	0.72	0.923J	ND (1)	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	9.0	ND (1)	73.0	73.5	24	ND (2)	24.8	38.9	460	6	157	ND (0.1)	0.327
Garfield	NA	06/02/05	8.0	22.3	8.1	266	0.49	9.29	ND (1)	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	7.3	ND (1)	56.7	41.6	35	ND (2)	12.5	28.3	274	4	92	ND (0.1)	0.595
Sunset	NA	06/02/05	7.8	19.2	7.2	234	0.88	17.1	0.969J (1)	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	8.5	ND (1)	119	108	37	3.5	34.6	58.4	420	12	221	ND (0.1)	0.322
Bangham	NA	06/02/05	8.3	20.2	7.1	215	0.64	6.66	0.710J (1)	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	5.2	ND (1)	70.8	55.5	50	3.7	19.8	35.3	380	5	170	ND (0.1)	0.397
Total			41	41	41	41	41	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45

Well	Screen	Sample Date	Specific Electrical Conductance	Dissolved Inorganic Carbon	Dissolved Nitrogen	Perchlorate ($\delta^{18}O$)	Perchlorate ($\Delta^{17}O$)	Perchlorate ($\delta^{37}Cl$)	Groundwater ($\delta^{18}O$)	Groundwater ($\delta^{2}H$)	Inorganic Chloride Isotope ($\delta^{37}Cl$)	Del He4	Del He3[j]	R(3/4)	Tritium/Helium (^{3}H-^{3}He Age)[j]	Tritium (^{3}H)	Strontium ($^{87}Sr/^{86}Sr$)	Strontium	Functional Genomic Test	
Units	No.	mm/dd/yy	umhos/cm	mg.L	mg/L	NA	NA	NA	NA	NA	NA	%	%	Ra	years	TU	NA	mg/L	Presence of cld gene[n]	Presence of cld mRNA[o]
MW-1	NA	06/05/05	595	470	17				-6.5	-42.7	0.06	NA[l]	NA[l]	NA[l]	NA[l]	3.902	0.7113	0.438	positive	positive
MW-16	NA	02/09/06				-21.8	0.023	0.4												
MW-16	NA	11/22/06				-20.7	-0.2	0.1												
MW-17	1	08/15/05	311	250	21				-7.5	-49.1						2.929	0.7114	0.2513		
	1 Dup	09/12/05																		
	2	08/15/05	875	450	19				-7.7	-55.6						6.596	0.7112	0.8619		
	3	08/15/05	719	380	18	-21.8	0.12	NA[m]	-7.5	-51.0	0.17	18.5	29.0	1.073	11.7	7.750	0.7116	0.6489	positive	negative
	4	08/15/05	323	250	22				-7.5	-52.0						0.537	0.7108	0.1851		
	5	08/15/05	317	220	21				-7.9	-55.2						0.865	0.7110[e]	0.149[e]		
MW-18	1	07/21/05	364	270	19				-7.5	-49.8						2.472	0.7114	0.312		
	2	07/21/05	489	380	18				-6.8	-46.9						2.910	0.7113	0.404		
	2 Dup	07/21/05	488																	
	3	07/21/05	547	430	15				-7.0	-48.7						2.394	0.7116	0.456		
	4	07/21/05	405	340	22				-6.9	-42.3						0.337	0.7122	0.402		
	5	07/21/05	288	250	21				-6.7	-44.2						0.136	0.7105	0.166		
MW-19	1	07/20/05	409	420	19				-7.7	-52.8						1.153	0.7111	0.383		
	2	07/20/05	1,040	280	20	-18.2	0.17	0.48	-7.8	-54.0	0.16	524	983	1.717	NA[k]	11.76	0.7106	0.883		
	3	07/20/05	629	370	18				-7.1	-46.9						2.365	0.7107	0.528		
	4	07/20/05	718	390	16				-7.2	-50.5						3.927	0.7109	0.672		
	4 Dup	07/20/05	706																	
	5	07/20/05	785	390	16				-7.4	-50.4						9.255	0.7110	0.775		
MW-20	1	08/01/05	636	340	18				-7.7	−51.1						4.355	0.7111	0.509		
	2	08/01/05	424	310	20				-7.2	-47.7						3.352	0.7108	0.373		
	3	08/01/05	576	430	21				-6.8	-45.5						2.475	0.7113	0.490		
	4	08/01/05	331	260	21				-7.5	-51.6						1.190	0.7110	0.110		
	5	08/01/05	307	260	23				-7.3	-48.4						0.079	0.7101	0.092		
MW-21	1	07/26/05	988	340	11				-7.9	-58.3						7.591	0.7103	1.209		
	2	07/26/05	1,290	610	19				-8.2	-57.4						8.040	0.7106	1.290		
	3	07/26/05	1,160	590	21				-8.1	-60.0						8.229	0.7109	0.999		
	3 Dup	07/26/05	1,160																	
	4	07/26/05	761	400	18				-8.1	-57.9						3.878	0.7109	0.603		
	5	07/26/05	808	390	19				-8.3	-62.1						4.996	0.7110	0.723		
MW-24	1	07/25/05	487	300	17	NA[m]	NA[m]	0.30	-6.7	-47.3	0.03	19.3	4.5	0.863	5.4	3.131	0.7114	0.387	positive	positive
	1 Dup	07/25/05	488																	
	2	07/25/05	451	290	18	NA[m]	NA[m]	NA[m]	-7.0	-45.6	0.03	436	821	1.700	NA[k]	3.194	0.7120	0.370		
	3	07/25/05	365	270	16				-6.8	-43.7						0.788	0.7130	0.297		
	4	07/25/05	297	220	18				-6.9	-44.0						0.299	0.7109	0.242		
	5	07/25/05	394	330	17				-7.0	-46.7						0.171	0.7112	0.345		
	5 Dup	09/09/05																		
MW-25	1	07/19/05	863	360	26	-18.7	0.83	2.05	-7.0	NA[m]	-0.02	159	190	1.111	NA[k]	5.549	0.7110	0.696		
	2	07/19/05	580	230	27	-16.3	2.00	0.18	-6.8	-46.2	0.12	127	2.9	0.45	NA[k]	2.299	0.7112	0.265		
	3	07/19/05	648	370	26	-16.8	2.01	0.06	-6.9	-46.1	0.11	98.4	122	1.105	NA[k]	2.693	0.7113	0.539	positive	negative
	4	07/19/05	679	420	33	-17.2	0.99	2.19	-6.7	-44.8	0.13	190	35.4	0.468	NA[k]	2.436	0.7112	0.519		
	5	07/19/05	436	280	16				-7.4	-48.0						0.141	0.7110	0.189		
OU-1		11/22/06				-19.3	0.1	0.3												
LAWC No. 3	NA	06/03/05	511	370	25	-20.4	-0.30	0.21	-7.4	-47.0	0.01	2.3	0.0	0.961	0	4.576	0.7114	0.399	negative	negative
LFWC No. 2	NA	06/03/05	638	360	24	-13.4	-0.13	1.10	-7.3	-48.4	0.06	NA[l]	NA[l]	NA[l]	NA[l]	5.079	0.7115	0.483	positive	negative
Garfield	NA	06/02/05	472	210	27	-15.0	1.74	NA[m]	-6.9	-45.7	0.01	97.1	17.3	0.592	19.5	2.165	0.7112	0.292	negative	negative
Sunset	NA	06/02/05	875	500	22	-17.8	-0.06	0.27	-6.9	-48.4	0.08	44.8	48.5	1.012	20.4	5.671	0.7112	0.748	positive	negative
Bangham	NA	06/02/05	631	360	24	-10.2	1.27	-3.01	-7.5	-52.6	0.03	45.3	27.4	0.866	23.1	2.589	0.7107	0.493	negative	negative
Total			45	41	41	14	14	14	41	41	14	13	13	13	13	41	41	41	9	9

Note: Water quality parameters and field measurements are analyzed/taken for all wells and screens plus 10% for duplicates, therefore there is a total of 45 samples.

(a) Operator noticed bubbles from the water pumped from the production wells (LAWC No. 3, LFWC No. 2, Garfield, Sunset, and Bangham).
(b) DO and ORP measurements were taken at a later date by Geofon during the fifth quarter sampling (Oct/Nov 2006).
(c) DOC results were consistently higher than TOC results. A special study conducted by the laboratory showed distilled and acidified water filtered with 0.45-µm filters with DOC concentrations at 7.6 and 20.8 mg/L, respectively indicating leaching from the filters.
(d) Perchlorate was analyzed by EMAX for MW-1, LAWC No. 3, LFWC No. 2, Garfield, Sunset, and Bangham. For the rest of the sampling locations, perchlorate was analyzed by APCL.
(e) Samples were recollected on August 23, 2005 due to laboratory error for NO_3 analysis.
(f) Samples were recollected on August 22, 2005 due to laboratory error for NO_3 analysis.
(g) Samples were recollected on August 22, 2006 because the initial samples arrived at the laboratory after the hold time.
(h) Samples were recollected on September 12, 2005 because laboratory did not analyze samples as scheduled.
(i) Samples were recollected on September 8, 2005 because laboratory did not analyze samples as scheduled.
(j) Samples were collected on September 9, 2006 because laboratory did not analyze samples as scheduled.
(k) He^3 results were not used due to large amounts of air components in the samples collected increasing the uncertainty of age determination.
(l) MW-1 and LFWC-2 did not yield viable helium samples for analysis.
(m) Samples were not analyzed by the laboratory as requested.
(n) Method for identifying the presence of perchlorate-reducing bacteria.
(o) Method for identifying the activity of the indigenous perchlorate-reducing bacteria.
NA = not available; Dup = duplicate; ND = not detect; DO = dissolvd oxygen; ORP = oxidation-reduction potential; DOC = dissolved organic carbon; TOC = total organic carbon; TDS = total dissolved solids; J = result is positively identified although the result is less than the reporting limit but greater than the method detection limit; E = result is above the maximum calibration range.

DATA QUALITY

The data generated for this project were verified by the Battelle Project Quality Assurance Officer. The verification process for the laboratory data involved ensuring that the holding times, precision, accuracy, laboratory blanks and detection limits were within the criteria outlined in the work plan.[1]

Precision was determined by calculating the relative percent difference (%RPD) between matrix spike/matrix spike duplicate (MS/MSD) pairs and laboratory control spike/laboratory control spike duplicate (LCS/LCSD) pairs in the analytical laboratory. All MS/MSD and LCS/LCSD samples met the precision (%RPD) criteria defined in the analytical methods.

Accuracy was determined by calculating the percent recovery (%R) for MS/MSD and for organic analytes, with surrogate compounds. Laboratory accuracy was also assessed from %R results generated from the periodic analysis of calibration check standards and laboratory control samples (LCS/LCSD). All MS/MSD and LCS/LCSD samples met the accuracy (% R) criteria defined in the analytical methods.

Sample analyses were conducted within the holding times specified in the work plan with the following exceptions: BioInsite performed the functional gene testing on groundwater samples from the MW-1 and the production wells 7 to 8 days post-collection. BioInsite performed the functional genenomic testing on groundwater samples from MW-24-1 and MW-25-3, 16 and 22 days post-collection. The maximum holding time requirement in the work plan was 48 hours. Samples were frozen by BioInsite at approximately -20ºF upon receipt and until analysis.

In addition, dissolved organic carbon (DOC) analyzed by EMAX laboratories was consistently higher than total organic carbon (TOC) for all samples collected. EMAX conducted a special study in August 2005 by filtering both distilled water and acidified water through their 0.45-μm filters. The results for DOC were 7.6 and 20.8 mg/L for distilled and acidified water, respectively indicating leaching from the filters. Therefore, DOC results are not considered valid data.

The helium (He^3) samples for productions wells (LAWC No. 3, LFWC No.2, Garfield, Sunset, and Bangham) had to be collected after an intermediate collector instead of directly at the wellhead due to the high flow rates of the production wells. In addition, University of Miami determined all He^3 samples except MW-17-3 and MW-24-1, had large amounts of air components in them increasing the uncertainty of age determination. Therefore, the He^3 results were not considered valid data.

Historical water quality data obtained from the various databases was evaluated for quality by doing a charge balance calculation. That is, the sum of the anions (A) and sum of the cations (C) should balance each other. Any deviation from zero is attributable to analytical error. Thus, a charge balance calculation, as show by the equation below, is a means to assess quality of older data sets.

$$\text{Charge Balance (\%)} = \frac{C-A}{C+A} \times 100$$

Samples having a charge balance within ±10% were regarded as being of good quality. Data for samples that did not meet this quality control criterion were rejected for consideration in this study.